RAW SEQUENCE LISTING DATE: 02/09/2001
PATENT APPLICATION: US/09/676,249A TIME: 12:19:22

Input Set : A:\PC10555A-SEQ-LIST.TXT
Output Set: N:\CRF3\02092001\I676249A.raw

```
     4 <110> APPLICANT: King, Kendall W
     5       Madura, Rebecca A
     6       Rosey, Everett L
     8 <120> TITLE OF INVENTION: NUCLEIC ACIDS AND PROTEINS OF THE MYCOPLASMA PNEUMONIAE
     9       mhp3 GENE AND USES THEREOF
    11 <130> FILE REFERENCE: PC10555
C--> 13 <140> CURRENT APPLICATION NUMBER: US/09/676,249A
C--> 14 <141> CURRENT FILING DATE: 2000-09-29
    15 <150> PRIOR APPLICATION NUMBER: US 60/156,602
    16 <151> PRIOR FILING DATE: 1999-09-29
    18 <160> NUMBER OF SEQ ID NOS: 41
    20 <170> SOFTWARE: PatentIn Ver. 2.1
    22 <210> SEQ ID NO: 1
    23 <211> LENGTH: 1692
    24 <212> TYPE: DNA
    25 <213> ORGANISM: Mycoplasma hyopneumoniae
    27 <400> SEQUENCE: 1
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    29 tcatcgtaat taaaacaatt aattaggaga acaactatga aaaaaaagat aaaatgaaat 120
    30 aaatttcttg gcttaggctt agtttttccg ctttcagcaa tcgcgacaat ctctgccgga 180
    31 tgttgggata aagaaacaac taaagaagaa aaatcagccg ataatcaaaa taagcaaatc 240
    32 actgatgtct caaaaatttc aggactagtt aatgaacgaa aatccgaaat tatggccgca 300
    33 aaagctgatg caaacaaaca ttttgggcta aatatggcaa ttgtaaccgc tggtggaacg 360
    34 gtaaatgata attcatttaa ccaatcaagt tgagaggcaa ttcaacaact tggcgctctt 420
    35 actggaggtg agattacttc agtagatagt tcaactgctg aacttgaagg aaaatatagc 480
    36 tcacttgcta ataccaacaa aaatgtttga gtactttctg gttttcaaca cggtgatgcg 540
    37 ttcacaagat gattaaaaat ccctgaaaat aagcaattat ttactgaaaa aaatattatc 600
    38 atactcggaa ttgactgaac tgatactgaa aatgtaattc caacaggtcg atatattaat 660
    39 ttaacctata aaactgaaga agccggatga cttgcaggat atgcgaatgc ttccttttg 720
    40 gcaaaaaaat tcccaagtga tccaactaaa agatcagcaa ttgttatcgg tggtgggatt 780
    41 tcgccagctg taactgattt tatcgctggt tatctagccg gaattaaagc ttgaaatcta 840
    42 aaaaattctg ataaaaaaac aaagataaca actgataaaa tcgagataaa tcttgggttt 900
    43 gatgttcaag atacttcaac aaaagaaaga cttgaacaaa ttgcttcaaa agataaacct 960
    44 tcaacactat tagctgtcgc tggaccactt actgaaattt tctcggatat aatcgcaaac 1020
    45 caaaatgatc gttatctcat tggtgttgac accgaccaat cacttgttta tacaaaaact 1080
    46 aaaaataaat ttttcacctc aattttgaaa aatttaggtt actccgtttt cagcgttctt 1140
    47 agtgatttat ataccaaaaa atcaaattca agaaatttag ccggctttga atttggtaaa 1200
    48 aaaagtgcaa ccgtttatct tggaattaaa gacaggtttg tcgatattgc tgatacttct 1260
    49 ttagaaggca atgataaaaa actcgcaact gaagccattt ctgaagctaa aaaagaattt 1320
    50 gaagaaaaaa ctaagacaat tcctgccgaa gaagttcgta aaactttaga aattccggaa 1380
    51 atgcctgata aacaacctga taagcaacag gaaagcttag acaaactaat taccgatatt 1440
    52 aataaaaatt aagtaagaaa aaataacaat tttttaacat tatatctttt tttagagatt 1500
    53 aattttcttc taatttagtt taatttaata taaaattata ttaaattaaa aaaataaaaa 1560
    54 atccggacta tttttgttcc ggatttttta tttttgtgtt actatttaat ataatgataa 1620
    55 atcaggatta tgcaattgaa tttattcaag tctcgaaaaa atttggcagt ttttatgcca 1680
    56 attacaaaat ag                                                    1692
    59 <210> SEQ ID NO: 2
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<211> LENGTH: 451
<212> TYPE: PRT
<213> ORGANISM: Mycoplasma hyopneumoniae
<400> SEQUENCE: 2

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Met Lys Lys Lys Ile Lys Trp Asn Lys Phe Leu Gly Leu Gly Leu Val
 1               5                  10                  15
Phe Pro Leu Ser Ala Ile Ala Thr Ile Ser Ala Gly Cys Trp Asp Lys
            20                  25                  30
Glu Thr Thr Lys Glu Glu Lys Ser Ala Asp Asn Gln Asn Lys Gln Ile
        35                  40                  45
Thr Asp Val Ser Lys Ile Ser Gly Leu Val Asn Glu Arg Lys Ser Glu
    50                  55                  60
Ile Met Ala Ala Lys Ala Asp Ala Asn Lys His Phe Gly Leu Asn Met
65                  70                  75                  80
Ala Ile Val Thr Ala Gly Gly Thr Val Asn Asp Asn Ser Phe Asn Gln
                85                  90                  95
Ser Ser Trp Glu Ala Ile Gln Gln Leu Gly Ala Leu Thr Gly Gly Glu
            100                 105                 110
Ile Thr Ser Val Asp Ser Ser Thr Ala Glu Leu Glu Gly Lys Tyr Ser
        115                 120                 125
Ser Leu Ala Asn Thr Asn Lys Asn Val Trp Val Leu Ser Gly Phe Gln
    130                 135                 140
His Gly Asp Ala Phe Thr Arg Trp Leu Lys Ile Pro Glu Asn Lys Gln
145                 150                 155                 160
Leu Phe Thr Glu Lys Asn Ile Ile Ile Leu Gly Ile Asp Trp Thr Asp
                165                 170                 175
Thr Glu Asn Val Ile Pro Thr Gly Arg Tyr Ile Asn Leu Thr Tyr Lys
            180                 185                 190
Thr Glu Glu Ala Gly Trp Leu Ala Gly Tyr Ala Asn Ala Ser Phe Leu
        195                 200                 205
Ala Lys Lys Phe Pro Ser Asp Pro Thr Lys Arg Ser Ala Ile Val Ile
    210                 215                 220
Gly Gly Gly Ile Ser Pro Ala Val Thr Asp Phe Ile Ala Gly Tyr Leu
225                 230                 235                 240
Ala Gly Ile Lys Ala Trp Asn Leu Lys Asn Ser Asp Lys Lys Thr Lys
                245                 250                 255
Ile Thr Thr Asp Lys Ile Glu Ile Asn Leu Gly Phe Asp Val Gln Asp
            260                 265                 270
Thr Ser Thr Lys Glu Arg Leu Glu Gln Ile Ala Ser Lys Asp Lys Pro
        275                 280                 285
Ser Thr Leu Leu Ala Val Ala Gly Pro Leu Thr Glu Ile Phe Ser Asp
    290                 295                 300
Ile Ile Ala Asn Gln Asn Asp Arg Tyr Leu Ile Gly Val Asp Thr Asp
305                 310                 315                 320
Gln Ser Leu Val Tyr Thr Lys Thr Lys Asn Lys Phe Phe Thr Ser Ile
                325                 330                 335
Leu Lys Asn Leu Gly Tyr Ser Val Phe Ser Val Leu Ser Asp Leu Tyr
            340                 345                 350
Thr Lys Lys Ser Asn Ser Arg Asn Leu Ala Gly Phe Glu Phe Gly Lys
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PATENT APPLICATION: US/09/676,249A TIME: 12:19:22

Input Set : A:\PC10555A-SEQ-LIST.TXT
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```
132         355                 360                 365
134 Lys Ser Ala Thr Val Tyr Leu Gly Ile Lys Asp Arg Phe Val Asp Ile
135     370                 375                 380
137 Ala Asp Thr Ser Leu Glu Gly Asn Asp Lys Lys Leu Ala Thr Glu Ala
138 385                 390                 395                 400
140 Ile Ser Glu Ala Lys Lys Glu Phe Glu Glu Lys Thr Lys Thr Ile Pro
141                 405                 410                 415
143 Ala Glu Glu Val Arg Lys Thr Leu Glu Ile Pro Glu Met Pro Asp Lys
144             420                 425                 430
146 Gln Pro Asp Lys Gln Gln Glu Ser Leu Asp Lys Leu Ile Thr Asp Ile
147         435                 440                 445
149 Asn Lys Asn
150     450
153 <210> SEQ ID NO: 3
154 <211> LENGTH: 1269
155 <212> TYPE: DNA
156 <213> ORGANISM: Artificial Sequence
158 <220> FEATURE:
159 <223> OTHER INFORMATION: Description of Artificial Sequence: mhp3
160       manipulated for in vitro expression
162 <400> SEQUENCE: 3
163 atgtgggata aagaaacaac taaagaagaa aaatcagccg ataatcaaaa taagcaaatc 60
164 actgatgtct caaaaatttc aggactagtt aatgaacgaa aatccgaaat tatggccgca 120
165 aaagctgatg caaacaaaca ttttgggcta aatatggcaa ttgtaaccgc tggtggaacg 180
166 gtaaatgata attcatttaa ccaatcargt tgggaggcaa ttcaacaact tggcgctctt 240
167 actggaggtg agattacttc agtagatagt tcaactgctg aacttgaagg aaaatatagc 300
168 tcacttgcta ataccaacaa aaatgtttgg gtactttctg gttttcaaca cggtgatgcg 360
169 ttcacaagat ggttaaaaat ccctgaaaat aagcaattat ttactgaaaa aaatattatc 420
170 atactcggaa ttgactggac tgatactgaa aatgtaattc caacaggtcg atatattaat 480
171 ttaacctata aaactgaaga agccggatgg cttgcaggat atgcgaatgc ttcctttttg 540
172 gcaaaaaaat tcccaagtga tccaactaaa agatcagcaa ttgttatcgg tggtgggatt 600
173 tcgccagctg taactgattt tatcgctggt tatctagccg gaattaaagc ttggaatcta 660
174 aaaaattctg ataaaaaaac aaagataaca actgataaaa tcgagataaa tcttgggttt 720
175 gatgttcaag atacttcaac aaaagaaaga cttgaacaaa ttgcttcaaa agataaacct 780
176 tcaacactat tagctgtcgc tggaccactt actgaaattt tctcggatat aatcgcaaac 840
177 caaaatgatc gttatctcat tggtgttgac accgaccaat cacttgttta tacaaaaact 900
178 aaaaataaat ttttcacctc aattttgaaa aatttaggtt actccgtttt cagcgttctt 960
179 agtgatttat ataccaaaaa atcaaattca agaaatttag ccggctttga atttggtaaa 1020
180 aaaagtgcaa ccgtttatct tggaattaaa gacaggtttg tcgatattgc tgatacttct 1080
181 ttagaaggca atgataaaaa actcgcaact gaagccattt ctgaagctaa aaaagaattt 1140
182 gaagaaaaaa ctaagacaat tcctgccgaa gaagttcgta aaactttaga aattccggaa 1200
183 atgcctgata aacaacctga taagcaacag gaaagcttag acaaactaat taccgatatt 1260
184 aataatcta                                                        1269
187 <210> SEQ ID NO: 4
188 <211> LENGTH: 423
189 <212> TYPE: PRT
190 <213> ORGANISM: Artificial Sequence
192 <220> FEATURE:
193 <223> OTHER INFORMATION: Description of Artificial Sequence: mhp3
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Input Set : A:\PC10555A-SEQ-LIST.TXT
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194 manipulated for in vitro expression
196 <400> SEQUENCE: 4
197 Met Trp Asp Lys Glu Thr Thr Lys Glu Glu Lys Ser Ala Asp Asn Gln
198 1 5 10 15
200 Asn Lys Gln Ile Thr Asp Val Ser Lys Ile Ser Gly Leu Val Asn Glu
201 20 25 30
203 Arg Lys Ser Glu Ile Met Ala Ala Lys Ala Asp Ala Asn Lys His Phe
204 35 40 45
206 Gly Leu Asn Met Ala Ile Val Thr Ala Gly Gly Thr Val Asn Asp Asn
207 50 55 60
209 Ser Phe Asn Gln Ser Gly Trp Glu Ala Ile Gln Gln Leu Gly Ala Leu
210 65 70 75 80
212 Thr Gly Gly Glu Ile Thr Ser Val Asp Ser Ser Thr Ala Glu Leu Glu
213 85 90 95
215 Gly Lys Tyr Ser Ser Leu Ala Asn Thr Asn Lys Asn Val Trp Val Leu
216 100 105 110
218 Ser Gly Phe Gln His Gly Asp Ala Phe Thr Arg Trp Leu Lys Ile Pro
219 115 120 125
221 Glu Asn Lys Gln Leu Phe Thr Glu Lys Asn Ile Ile Ile Leu Gly Ile
222 130 135 140
224 Asp Trp Thr Asp Thr Glu Asn Val Ile Pro Thr Gly Arg Tyr Ile Asn
225 145 150 155 160
227 Leu Thr Tyr Lys Thr Glu Glu Ala Gly Trp Leu Ala Gly Tyr Ala Asn
228 165 170 175
230 Ala Ser Phe Leu Ala Lys Lys Phe Pro Ser Asp Pro Thr Lys Arg Ser
231 180 185 190
233 Ala Ile Val Ile Gly Gly Gly Ile Ser Pro Ala Val Thr Asp Phe Ile
234 195 200 205
236 Ala Gly Tyr Leu Ala Gly Ile Lys Ala Trp Asn Leu Lys Asn Ser Asp
237 210 215 220
239 Lys Lys Thr Lys Ile Thr Thr Asp Lys Ile Glu Ile Asn Leu Gly Phe
240 225 230 235 240
242 Asp Val Gln Asp Thr Ser Thr Lys Glu Arg Leu Glu Gln Ile Ala Ser
243 245 250 255
245 Lys Asp Lys Pro Ser Thr Leu Leu Ala Val Ala Gly Pro Leu Thr Glu
246 260 265 270
248 Ile Phe Ser Asp Ile Ile Ala Asn Gln Asn Asp Arg Tyr Leu Ile Gly
249 275 280 285
251 Val Asp Thr Asp Gln Ser Leu Val Tyr Thr Lys Thr Lys Asn Lys Phe
252 290 295 300
254 Phe Thr Ser Ile Leu Lys Asn Leu Gly Tyr Ser Val Phe Ser Val Leu
255 305 310 315 320
257 Ser Asp Leu Tyr Thr Lys Lys Ser Asn Ser Arg Asn Leu Ala Gly Phe
258 325 330 335
260 Glu Phe Gly Lys Lys Ser Ala Thr Val Tyr Leu Gly Ile Lys Asp Arg
261 340 345 350
263 Phe Val Asp Ile Ala Asp Thr Ser Leu Glu Gly Asn Asp Lys Lys Leu
264 355 360 365
266 Ala Thr Glu Ala Ile Ser Glu Ala Lys Lys Glu Phe Glu Glu Lys Thr

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Input Set : A:\PC10555A-SEQ-LIST.TXT
Output Set: N:\CRF3\02092001\I676249A.raw

```
267     370                 375                 380
269 Lys Thr Ile Pro Ala Glu Glu Val Arg Lys Thr Leu Glu Ile Pro Glu
270 385                 390                 395                 400
272 Met Pro Asp Lys Gln Pro Asp Lys Gln Gln Glu Ser Leu Asp Lys Leu
273                 405                 410                 415
275 Ile Thr Asp Ile Asn Asn Leu
276             420
279 <210> SEQ ID NO: 5
280 <211> LENGTH: 602
281 <212> TYPE: DNA
282 <213> ORGANISM: Mycoplasma hyopneumoniae
284 <400> SEQUENCE: 5
285 atgataatat ttttttcagt aaataattgc ttattttcag ggatttttaa tcatcttgtg 60
286 aacgcatcac cgtgttgaaa accagaaagt actcaaacat ttttgttggt attagcaagt 120
287 gagctatatt ttccttcaag ttcagcagtt gaactatcta ctgaagtaat ctcacctcca 180
288 gtaagagcgc caagttgttg aattgcctct caacttgatt ggttaaatga attatcattt 240
289 accgttccac cagcggttac aattgccata tttagcccaa aatgtttgtt tgcatcagct 300
290 tttgcggcca taatttcgga ttttcgttca ttaactagtc ctgaaatttt tgagacatca 360
291 gtgatttgct tattttgatt atcggctgat ttttcttctt tagttgtttc tttatcccaa 420
292 catccggcag agattgtcgc gattgctgaa agcggaaaaa ctaagcctaa gccaagaaat 480
293 ttatttcatt ttatcttttt tttcatagtt gttctcctaa ttaattgttt taattacgat 540
294 gactttcaat tatttttaa taaattaatt tttattttac attttctatt atattcaaaa 600
295 ac                                                              602
298 <210> SEQ ID NO: 6
299 <211> LENGTH: 200
300 <212> TYPE: PRT
301 <213> ORGANISM: Mycoplasma hyopneumoniae
303 <400> SEQUENCE: 6
304 Met Ile Ile Phe Phe Ser Val Asn Asn Cys Leu Phe Ser Gly Ile Phe
305   1               5                  10                  15
307 Asn His Leu Val Asn Ala Ser Pro Cys Trp Lys Pro Glu Ser Thr Gln
308              20                  25                  30
310 Thr Phe Leu Leu Val Leu Ala Ser Glu Leu Tyr Phe Pro Ser Ser Ser
311          35                  40                  45
313 Ala Val Glu Leu Ser Thr Glu Val Ile Ser Pro Pro Val Arg Ala Pro
314      50                  55                  60
316 Ser Cys Trp Ile Ala Ser Gln Leu Asp Trp Leu Asn Glu Leu Ser Phe
317  65                  70                  75                  80
319 Thr Val Pro Pro Ala Val Thr Ile Ala Ile Phe Ser Pro Lys Cys Leu
320                  85                  90                  95
322 Phe Ala Ser Ala Phe Ala Ala Ile Ile Ser Asp Phe Arg Ser Leu Thr
323              100                 105                 110
325 Ser Pro Glu Ile Phe Glu Thr Ser Val Ile Cys Leu Phe Trp Leu Ser
326          115                 120                 125
328 Ala Asp Phe Ser Ser Leu Val Val Ser Leu Ser Gln His Pro Ala Glu
329      130                 135                 140
331 Ile Val Ala Ile Ala Glu Ser Gly Lys Thr Lys Pro Lys Pro Arg Asn
332 145                 150                 155                 160
334 Leu Phe His Phe Ile Phe Phe Phe Ile Val Val Leu Leu Ile Asn Cys
```

FYI:

Please Note:

Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

VERIFICATION SUMMARY DATE: 02/09/2001
PATENT APPLICATION: US/09/676,249A TIME: 12:19:23

Input Set : A:\PC10555A-SEQ-LIST.TXT
Output Set: N:\CRF3\02092001\I676249A.raw

L:13 M:270 C: Current Application Number differs, Replaced Application Number
L:14 M:271 C: Current Filing Date differs, Replaced Current Filing Date
L:355 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:7
L:396 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:10
L:402 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10
L:424 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:12
L:430 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:12
L:452 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:14
L:458 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:14